AMENDMENTS TO THE CLAIMS

Claims 1-25 (Canceled)

26. (Previously Presented) A biosensor circuit arrangement comprising:

a substrate;

a sensor element formed in or on a surface region of the substrate with a physical parameter, which is coupled to a substance to be examined, the type of coupling having a resistive component, the sensor element having an electrically conductive sensor electrode that is coupled to the substance to be examined, the sensor element having a measuring transistor the gate terminal of which is coupled to the electrically conductive sensor electrode, and the physical parameter being the threshold voltage of the measuring transistor; and

a calibration device formed in or on the substrate, said calibration device being set up such that it is used to at least partly compensate for an alteration of the value of the physical parameter of the sensor element.

27. (Previously Presented) The biosensor circuit arrangement as claimed in claim 26, further comprising a device for detecting an electrical parameter characterizing an effected sensor event, the device being coupled to a first source/drain terminal of the measuring transistor.

28. (Previously Presented) The biosensor circuit arrangement as claimed in claim 27, wherein the calibration device is set up such that it is used to control the electrical potential applied to the first or a second source/drain terminal of the measuring transistor in such a way that it can set a sensor signal of the sensor element, said sensor signal being brought about by a sensor event, to a value which is independent of the value of the physical parameter of the sensor element.

29. (Previously Presented) The biosensor circuit arrangement as claimed in claim 28, wherein the calibration device is set up such that it is used to control the electrical potential present at the first source/drain terminal of the measuring transistor.

30. (Currently Amended) The biosensor circuit arrangement as claimed in claim 29, wherein a first electrical reference potential is applied to the second source/drain terminal of the measuring transistor, and in which the calibration device has a calibration transistor having a first and a second source/drain terminal, which are connected between the first source/drain terminal of the measuring transistor and the device for detecting an electrical parameter, and ~~it is possible to apply~~ to the gate terminal thereof an electrical signal is applied such that the electrical potential which is applied to the first source/drain terminal of the measuring transistor is set such that the alteration of the value of the physical parameter of the sensor element can at least partly be compensated for.

31. (Previously Presented) The biosensor circuit arrangement as claimed in claim 29, wherein the calibration device is set up

such that it is used to control the electrical potential present at the second source/drain terminal of the measuring transistor.

32. (Currently Amended) The biosensor circuit arrangement as claimed in claim 31, wherein the first source/drain terminal of the measuring transistor is coupled to the device for detecting an electrical parameter, and wherein the calibration device has a calibration transistor having a first source/drain terminal, which is coupled to the second source/drain terminal of the measuring transistor, and a second source/drain terminal, to which a second electrical reference potential is applied, and to the gate terminal of which ~~it is possible to apply~~ an electrical signal is applied such that the electrical potential which is applied to the second source/drain terminal of the measuring transistor is set such that the alteration of the value of the physical parameter of the sensor element can at least partly be compensated for.

33. (Previously Presented) The biosensor circuit arrangement as claimed in claim 31, wherein the calibration device comprises:

a calibration transistor;

a first constant-current source, which is coupled to respective second source/drain terminals of the measuring and calibration transistors that are connected in parallel with one another, for the provision of a predeterminable electrical current intensity; and

a current mirror circuit, which is coupled to respective first source/drain terminals of the measuring and calibration transistors that are connected in parallel with one another, and which is connected such that it is used to set, for at least partly

compensating for the alteration of the value of the physical parameter, the electrical potential at the gate terminal of the calibration transistor such that, in the absence of a sensor event, the current flows between the two source/drain terminals of the measuring transistor and of the calibration transistor are identical.

34. (Previously Presented) The biosensor circuit arrangement as claimed in claim 31, wherein a third electrical reference potential is applied to the first source/drain terminal of the measuring transistor, and wherein the calibration device comprises:

a calibration transistor having a first and a second source/drain terminal;

a second constant-current source, which is coupled to the respective second source/drain terminals of the measuring and calibration transistors that are connected in parallel with one another, for the provision of a predeterminable electrical current intensity; and

a third constant-current source, which is coupled to the first source/drain terminal of the calibration transistor, for the provision of a further predeterminable electrical current intensity, the third constant-current source being connected such that it is used to set, for at least partly compensating for the alteration of the value of the physical parameter, the potentials that are applied to the terminals of the transistors such that, in the absence of a sensor event, the current flows between the two source/drain terminals of the measuring transistor and of the calibration transistor are identical.

35. (Currently Amended) The biosensor circuit arrangement as claimed in claim 27, wherein the calibration device is set up such that it is used to convert a sensor signal of the sensor element, said sensor signal being brought about by a sensor event, using ~~the~~ a principle of correlated double sampling to a value which is independent of the value of the physical parameter of the sensor element.

36. (Previously Presented) The biosensor circuit arrangement as claimed in claim 35, wherein a fourth electrical reference potential is applied to a second source/drain terminal of the measuring transistor;

wherein the calibration device comprises:

an electrical subtraction device having two inputs and an output, which is coupled to the device for detecting an electrical parameter, a first one of the two inputs is coupled to the first source/drain terminal of the measuring transistor, and the electrical subtraction device is set up such that a difference between two electrical signals applied to the two inputs is provided at its output; and

a sample-and-hold element connected between the first source/drain terminal of the measuring transistor and the second input of the electrical subtraction device; and

wherein the calibration device is set up such that:

in a first operating state, a sensor signal dependent on the physical parameter of the sensor element is impressed into the sample-and-hold element and is provided to the second input of the electrical subtraction device;

in a second operating state, a signal which is characteristic of the physical parameter of the sensor element

is provided to the input of the electrical subtraction device; and

a sensor signal independent of the value of the physical parameter of the sensor element is provided at the output of the electrical subtraction device, as a result of which the alteration of the value of the physical parameter is at least partly compensated for.

37. (Previously Presented) The biosensor circuit arrangement as claimed in claim 27, wherein the electrical parameter is an electrical voltage or an electric current.

38. (Previously Presented) The biosensor circuit arrangement as claimed in claim 26, wherein the sensor electrode has one or a combination of materials selected from the group consisting of titanium, titanium nitride, gold, and platinum.

39. (Previously Presented) The biosensor circuit arrangement as claimed in claim 26, further comprising an amplifier element for amplifying a sensor signal.

40. (Currently Amended): The biosensor circuit arrangement as claimed in claim 36, further comprising a switching device set up such that it is used optionally to couple the sensor element to a fifth electrical reference potential or to decouple it from the latter, in order to protect the sensor element from damage ~~and/or in order to apply a defined electrical potential to the sensor element~~.

41. (Previously Presented) The biosensor circuit arrangement as claimed in claim 26, wherein the substrate is a silicon substrate.

42. (Previously Presented) The biosensor circuit arrangement as claimed in claim 26, wherein a type of coupling between the sensor element and a liquid to be examined has a capacitive component.

43. (Previously Presented) A sensor array having a plurality of biosensor circuit arrangements as claimed in claim 26, wherein said biosensor circuit arrangements are arranged essentially in matrix form in crossover regions of row and column lines and being connected up to the row and column lines.

44. (Currently Amended) The sensor array as claimed in claim 43, wherein at least a portion of the biosensor circuit arrangements have a selection element – coupled to the respectively associated row line and column line – for selection of the respective sensor arrangement to detect a sensor signal of the sensor element of the selected biosensor circuit arrangement and ~~and/or~~, in the case of the selected biosensor circuit arrangement, at least partly to compensate for the alteration of the value of the physical parameter. ~~and/or to apply a fifth electrical potential to the sensor element of the selected biosensor circuit arrangement~~.

45. (Canceled)

46. (Canceled)

47. (Previously Presented) The sensor array as claimed in claim 43, wherein at least a portion of the column lines are coupled to a potential control device, which is set up such that it holds the electrical potential of the associated column line at an essentially constant value.

48. (Previously Presented) A biosensor array having a sensor array as claimed in claim 43.

49. (New) The biosensor circuit arrangement as claimed in claim 36, further comprising a switching device set up such that it is used optionally to couple the sensor element to a fifth electrical reference potential or to decouple it from the latter, in order to apply a defined electrical potential to the sensor element.

50. (New) The biosensor circuit arrangement as claimed in claim 36, further comprising a switching device set up such that it is used optionally to couple the sensor element to a fifth electrical reference potential or to decouple it from the latter, in order to protect the sensor element from damage and in order to apply a defined electrical potential to the sensor element.

51. (New) The sensor array as claimed in claim 43, wherein at least a portion of the biosensor circuit arrangements have a selection element - coupled to the respectively associated row line and column line - for selection of the respective sensor arrangement to detect a sensor signal of the sensor element of the selected biosensor circuit arrangement and, in the case of the selected biosensor circuit arrangement, to apply a fifth

electrical potential to the sensor element of the selected biosensor circuit arrangement.

52. (New) The sensor array as claimed in claim 43, wherein at least a portion of the biosensor circuit arrangements have a selection element - coupled to the respectively associated row line and column line - for selection of the respective sensor arrangement to detect a sensor signal of the sensor element of the selected biosensor circuit arrangement and, in the case of the selected biosensor circuit arrangement, at least partly to compensate for the alteration of the value of the physical parameter and to apply a fifth electrical potential to the sensor element of the selected biosensor circuit arrangement.

53. (New) The sensor array as claimed in claim 43, wherein at least a portion of the biosensor circuit arrangements have a selection element - coupled to the respectively associated row line and column line - for selection of the respective sensor arrangement to detect a sensor signal of the sensor element of the selected biosensor circuit arrangement or, in the case of the selected biosensor circuit arrangement, at least partly to compensate for the alteration of the value of the physical parameter.

54. (New) The sensor array as claimed in claim 43, wherein at least a portion of the biosensor circuit arrangements have a selection element - coupled to the respectively associated row line and column line - for selection of the respective sensor arrangement to detect a sensor signal of the sensor element of the selected biosensor circuit arrangement or, in the case of the

selected biosensor circuit arrangement, to apply a fifth electrical potential to the sensor element of the selected biosensor circuit arrangement.

55. (New) The sensor array as claimed in claim 43, wherein at least a portion of the biosensor circuit arrangements have a selection element - coupled to the respectively associated row line and column line - for selection of the respective sensor arrangement to detect a sensor signal of the sensor element of the selected biosensor circuit arrangement or, in the case of the selected biosensor circuit arrangement, at least partly to compensate for the alteration of the value of the physical parameter and to apply a fifth electrical potential to the sensor element of the selected biosensor circuit arrangement.

56. (New) The sensor array as claimed in claim 43, wherein at least a portion of the biosensor circuit arrangement assigned to a respective row line comprises a common device for detecting an electrical parameter that characterizes an effected sensor event, a common constant-current source, a common switching device, a common reference potential, a common current-voltage converter, a common analog-digital converter, a common current mirror, a common subtraction device, a common sample-and-hold element, and a common amplifier.

57. (New) The sensor array as claimed in claim 43, wherein at least a portion of the biosensor circuit arrangement assigned to a respective row line comprises a common device for detecting an electrical parameter that characterizes an effected sensor event, a common constant-current source, a common

switching device, a common reference potential, a common current-voltage converter, a common analog-digital converter, a common current mirror, a common subtraction device, a common sample-and-hold element, or a common amplifier.

58. (New) The sensor array as claimed in claim 43, wherein at least a portion of the biosensor circuit arrangement assigned to a respective column line comprises a common device for detecting an electrical parameter that characterizes an effected sensor event, a common constant-current source, a common switching device, a common reference potential, a common current-voltage converter, a common analog-digital converter, a common current mirror, a common subtraction device, a common sample-and-hold element, and a common amplifier.

59. (New) The sensor array as claimed in claim 43, wherein at least a portion of the biosensor circuit arrangement assigned to a respective column line comprises a common device for detecting an electrical parameter that characterizes an effected sensor event, a common constant-current source, a common switching device, a common reference potential, a common current-voltage converter, a common analog-digital converter, a common current mirror, a common subtraction device, a common sample-and-hold element, or a common amplifier.

60. (New) The sensor array as claimed in claim 43, wherein at least a portion of the row lines in each case have a device for detecting an electrical parameter that characterizes and effected sensor event, the sensor array being set up such that the device for detecting and electrical parameter that is

assigned to a respective row or column line can detect a sensor signal of precisely one sensor arrangement of the respective row or column line, or a sum of sensor signals of at least a portion of the sensor arrangement of the respective row or column line.

61. (New) The sensor array as claimed in claim 43, wherein at least a portion of the column lines in each case have a device for detecting an electrical parameter that characterizes an effected sensor event, the sensor array being set up such that the device for detecting an electrical parameter that is assigned to a respective row or column line can detect a sensor signal of precisely one sensor arrangement of the respective row or column line, or a sum of sensor signals of at least a portion of the sensor arrangement of the respective row or column line.

62. (New) The sensor array as claimed in claim 43, wherein at least a portion of the row lines and the column lines in each case have a device for detecting an electrical parameter that characterizes an effected sensor event, the sensor array being set up such that the device for detecting an electrical parameter that is assigned to a respective row or column line can detect a sensor signal of precisely one sensor arrangement of the respective row or column line, or a sum of sensor signals of at least a portion of the sensor arrangement of the respective row or column line.